CLAIMS

We Claim:

1.   A circuit based network comprising a plurality of Nodes interconnected by Links, wherein:

    (a)   each Node is assigned a set of one or more coordinate labels, each representing a path comprising one or more Links or other Nodes;

    (b)   each coordinate label is unique to the Node to which it is assigned;

    (c)   a path between a first Node and a second Node being determined from one of said coordinate labels associated with said first Node and one of said coordinate labels associated with said second Node; and

    (d)   said network is configured according to said path.

2.   The network of claim 1 where said coordinate label represents a path between said Node to which said coordinate label is assigned and a root Node.

3.   The network of claim 1 where said coordinate label represents a path between said Node to which said coordinate label is assigned and at least one of a plurality of root Nodes.

4.   The network of claim 1 where at least one of said plurality of Nodes is a computer file.

5.   The network of claim 1 where at least one of said one or more Links is a directory access path.

6.   The network of claim 1 where at least one of said plurality of Nodes is a computer process.

7.   The network of claim 1 where at least one of said one or more Links is a directory access path.

8.   The network of claim 1 where at least one of said Links is a virtual Link.

9.   The network of claim 1 where at least one of said one or more Links is an optical Link.

10.   The network of claim 1 where at least one of said set of one or more coordinate labels includes a wavelength identifier.

11.   The network of claim 1 wherein at least one of said set of one or more coordinate labels includes a wavelength of an optical Link.

12.   The network of claim 1 wherein each coordinate label representing a path comprises, in series, identifiers for Links and Nodes comprising said path.

13.   The network of claim 1 wherein each of said set of one or more coordinate labels is periodically updated to reflect changes in said path.

14. The network of claim 1 wherein a Node identifier is indexed to at least one of said set of one or more coordinate labels, where said at least one of said set of one or more coordinate labels corresponds to at least one of said plurality of Nodes.

15. The network of claim 1 wherein at least one of said coordinate labels contains path information from said network and a second network.

16. The network of claim 15 where said path information from said second network indicates a backbone address.

17. The network of claim 1 wherein:

    said first Node is a source Node; and

    said second Node is a destination Node; and data is routed from said source Node to said destination Node via said path.

18. The network of claim 17 wherein said data is routed to a plurality of destination Nodes.

19. The network of claim 1 wherein a tree of routing paths is computed from at least one of said set of one or more coordinate labels.

20. The network of claim 19 wherein data is routed to at least one of said plurality of Nodes according to said tree of routing paths.

21. The network of claim 1 wherein a multi-cast tree is computed from a plurality of said set of one or more coordinate labels.

22.   The network of claim 21 where data is routed to a plurality of said plurality of Nodes according to said multi-cast tree.

23.   The network of claim 1 where said set of one or more coordinate labels does not disclose information relating to a physical structure of said network.

24.   The network of claim 1 where said network is a MPLS network.

25.   The network of claim 1 where said Nodes are assigned to said set of one or more coordinate labels through the use of a MPLS label switching table.

26.   The network of claim 1 where said path is used to calculate a MPLS routing table.

27.   The network of claim 1 where said path is used to support MPLS explicit routing.

28.   The network of claim 1 where said network is reconfigured based upon a second path upon the occurrence of an network event

29.   The network of claim 28 where said event is the failure of a link on said path.

30.   The network of claim 28 where said event is the failure of a node on said path.

31.   The network of claim 28 where said event is the movement of a node on said path.

32.   The network of claim 1 where said one or more coordinate labels is further comprised of coordinate labels from a first virtual network, and coordinate labels from at least one second network.

33. A method for determining a path from a source Node to a destination Node in a circuits based network comprising a plurality of Nodes interconnected by Links, said Nodes including a first Node, and a plurality of second Nodes, said second Nodes including said source Node and destination Node, said method comprising the steps of:

(a) assigning to each of said second Nodes, including said source Node and said destination Node, one or more coordinate labels, each coordinate label assigned to a second Node representing a path through said network from said second Node to said first Node;

(b) determining a path from said source Node to said destination Node by combining one coordinate label of said source Node and one coordinate label of said destination Node; and

(c) configuring said network according to said path.

34. The method of claim 33 wherein each coordinate label representing a path comprises, in series, identifiers for Links and Nodes comprising said path.

35. The method of claim 33 wherein each coordinate label representing a path is periodically updated to reflect changes in said path.

36. The method of claim 33 wherein said method comprises:
routing data from said source Node to said destination Node via said path between said source Node and said destination Node.

37. The method of claim 36 wherein said data is routed to a plurality of destination Nodes.

38. The method of claim 33 where said coordinate labels do not disclose information relating to a physical structure of said network.

39. The method of claim 33 further comprising the step of reconfiguring said network based upon a second path upon the occurrence of an network event

40. The method of claim 39 where said event is the failure of a link on said path.

41. The method of claim 39 where said event is the failure of a node on said path.

42. The method of claim 39 where said event is the movement of a node on said path.

43. The method of claim 33 where said one or more coordinate labels is further comprised of coordinate labels from a first virtual network, and coordinate labels from at least one second network.

44. A Node for use in a circuits based network, said network comprising a plurality of Nodes connected by Links, wherein:
said Node for use in said network has one or more coordinate labels assigned thereto, each coordinate label representing a path from said Node to a particular other Node of said network, each of said coordinate labels being unique to said Node, and said network is configured according to said path.

45. The Node of claim 44 wherein each coordinate label representing a path comprises, in series, addresses for Links and Nodes comprising said path.

46. The Node of claim 44 wherein each coordinate label representing a path is periodically updated to reflect a change in said path.

47. The Node of claim 44 wherein:

said Node routes data to a destination Node via a path determined by combining one of said coordinate labels of said Node and a coordinate label of said destination Node.

48. The Node of claim 47 wherein said packet is routed to a plurality of destination Nodes.

49. The Node of claim 44 where said coordinate labels do not disclose information relating to a physical structure of said network.

50. The Node of claim 44 where said one or more coordinate labels is further comprised of coordinate labels from a first virtual network, and coordinate labels from at least one second network.